PRISMA Promoting Rural Income through Support for Markets in Agriculture

Kementerian PPN/ Bappenas

Australian Aid

Livelihood Profile

Soybean Farmers in Trenggalek, East Java

June 2016

Contents

Livelihood Profile of Soybean Farmers in Trenggalek, East Java

1. Purpose of Study

The purpose of this study is to build a socio-economic profile of PRISMA's target group for each subsector to better understand their livelihood position. It also aims to understand the context of their poverty and vulnerability so as to determine how they behave and the drivers behind this behaviour. The goal of this study is to understand soybean farmers in Trenggalek, East Java, and their decisions related to cultivating this crop. Therefore, to understand PRISMA's target group and how and why soybean farmers in Trenggalek make certain decisions, the main research questions of this study are:

I. What is the socio-economic position of farmers?
II. What are common livelihood patterns and strategies of farmers in Trenggalek?
III. What is the importance of soybean for farmers' livelihoods?
IV. What are determinants and mechanisms of decisions related to soybean?

This study uses both qualitative research methods through focus group discussions (FGDs) and interviews, and a quantitative survey of 53 households. The UK Department for International Development (DFID) Sustainable Livelihood approach and the Progress out of Poverty Index (PPI) were also employed to guide the research methodology in finalising this report.

2. Audience

The target beneficiaries of this study are:

I. PRISMA Intervention teams – to gain more insight into the behaviours of their target groups in order to design smarter interventions and/or make revisions as might be required. For example adjusting targeting or intervention logic
II. PRISMA steering review panel – to use the results of the study to guide the technical thinking of the PRISMA internal teams
III. Department of Foreign Affairs and Trade (DFAT) – to provide a tangible picture of the target group PRISMA teams work with, the characteristics of communities at risk of poverty and what they may look like
IV. Ministry of National Development Planning – to understand PRIMA's work in specific agricultural subsectors and gain an overall picture of its target group and behaviours

The results from this study might be used to compile other case studies and communication materials showcasing PRISMA's work.

3. Introduction and methodology

Indonesia is a rising consumer of soybeans, but it currently only produces one third of the soybeans it consumes. Demand is driven by the food processing industry, particularly tempeh and tofu processing. Soybean is one of the most important sources of protein for Indonesians in both rural and urban areas. Indonesia relies on a sizable amount of soybean imports to fulfil domestic demand, with imports having increased on average by 10% each year between 2005 and 2015.

East Java is the epicentre of soybean production in Indonesia, accounting for 43% of national production. Soybean production in East Java is supported by a large harvested area; accounting for 35% of Indonesia's

soybean harvested area in 2012. Java is also the place of origin of the traditional production of tempeh and tofu – a tradition, which dates back to the 16th century[1].

While there has been an upward trend in productivity, yields continue to be low in comparison to international benchmarks and the genetic potential of available cultivars. Soybean farming, which is a secondary crop for farmers, complements the intensive cultivation of more highly valued primary crops and provides additional income stream to farmers in the post-rice or maize harvest seasons.

There is a market opportunity to expand East Java's soybean production in order to meet the growing demand for soybean from the food processing industry. Tofu and tempeh consumption are on the rise as local population have developed a preference for these sources of protein. Processors have also reported robust production and sales growth over the past five years and expect to continue expanding their operations. As a result, there is an existing and growing market that is able to absorb increases in local soybean production.

Following the national goal for self-sufficiency in soybean the Indonesian government wants to boost soybean production in East Java by increasing productivity. Because Soybeans is a secondary crop and complements either paddy or maize farming in the off-season (dry season), farmers tend to invest very little both in terms of time and money. In view of the low investment, poor farmers are likely to cultivate soybean and is therefore predestined for pro-poor interventions.

Insert Soybean Sector Map here…….

3.1. Intervention selection

Analysis of the soybean market reveals a number of problems that reduce the ability of farmers to take advantage of opportunities that may exist. Farmer productivity is low because of poor quality seeds and poor agricultural practices. Limited access to good quality certified seeds and improved soybean seed varieties means that farmers continue to use degenerated seeds with low and declining yields. Furthermore, they are unable to maximise yields because they have limited access to information on good agricultural practices (including on pest and disease control strategies) and are reluctant to invest in better practices and/or pesticides and insecticides due to the perceived low returns from soybean farming

These problems are compounded with weaknesses in seed, information and extension services. Although there are a few established nurseries that produce certified seeds, most do not have commercial distribution channels. In general, nurseries face large obstacles when trying to obtain seed certification, and there are high barriers to entry into the soybean nursery business. While government research institutions have developed improved, higher-yielding soybean varieties, they have low capacity to promote these new varieties. At the same time, many private seed companies have not considered soybean seeds as a potential market opportunity. Finally, public provision of information and extension services is poor and there is a lack of private alternatives.

The vision of change at the sector level is to increase smallholder productivity and make soybean farming more profitable. To realise this vision, the following two intervention areas were recommended:

- Promoting good quality certified seeds
- Providing information on Good Agricultural Practises (GAP) to farmers through demonstration plots.

[1] (PRISMA Internal team 2014)

It is further recommended that the intervention areas in the East Java soybean sector be implemented in two phases. In the first phase, the focus and priority will be on promoting good quality certified seeds since PRISMA already has several partners and on-going interventions in this area. This will be followed by a second phase which involves promoting GAP with partners in Madiun and Ngawi districts starting in June 2016.

For the purpose of this study and comparing behaviours, we will assess “users” of certified soybean seeds and “non-users”.

3.2. Map and demographics

There are 4 sub-districts in Trenggalek where certified soybeans are distributed by the government. The sample villages were chosen because of a high probability of identifying farmers that use certified soybean seeds. Since the government started distributing subsidised soybean seed over ten years ago, the PRISMA livelihood consultant aimed to get a balanced sample by tracking farmers that spend either their own money to buy seeds or use seeds from their own harvest.

The chosen villages of Karangan (marked Red) and Sambirejo (marked Blue) are both close to the city of Trenggalek and fairly urbanized. Masaran (marked Green) village on the other hand is on the southern cost, remote and surrounded by hills; making it somewhat difficult to access.

Figure 1: Map of Trenggalek region

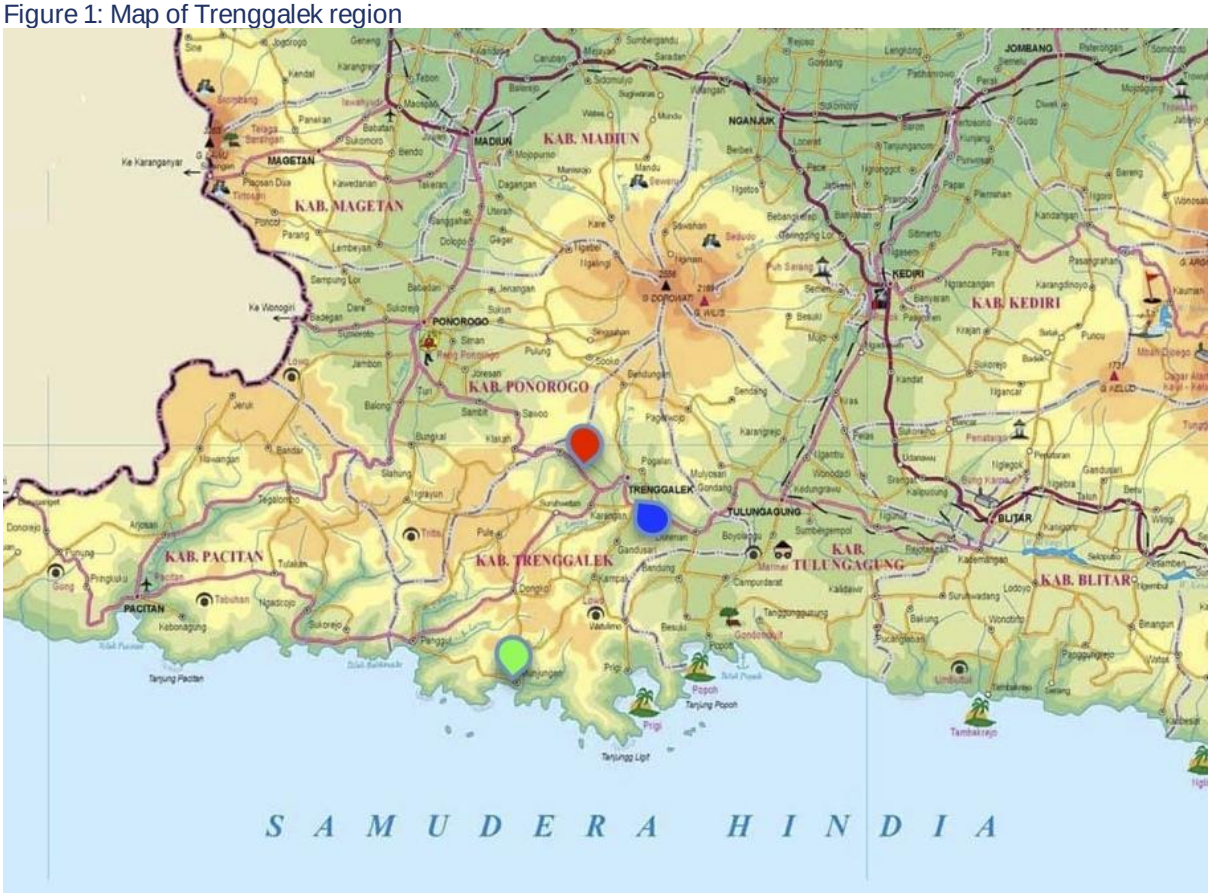


Table 1. Overview of villages sampled (Incomplete)

VILLAGE OVERVIEW	Karangan	Sambirejo	Masaran
Sub-district	Karangan		Munjungan
Sub-district Population (2010 Census)	13'350	3'611	8'157
No of Soybeans farmer households	450	1'360	2'150
No of female headed households		240	
Average household size	4		
Distance to Central District			
Distance to Central Sub-District			

3.3. Sampling

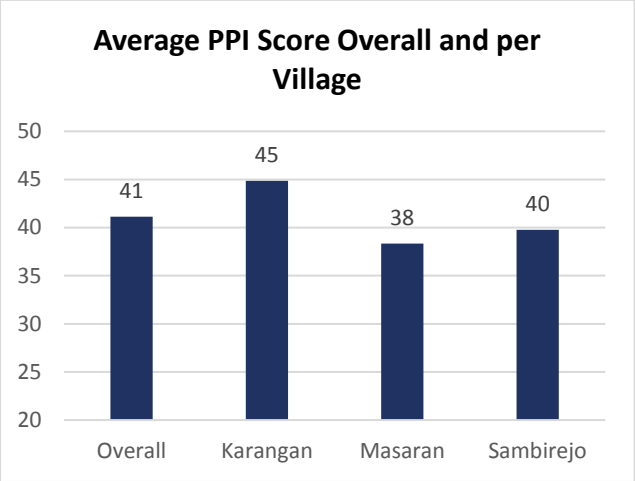
For the purpose of this study, the total sample size being evaluated is 53 households across three villages comprising 19 households in Karangan, 17 in Sambirejo and 17 in Masaran. These households were chosen randomly. All respondents are therefore soybean farmers. Of these total, 43% use some type of certified seed whilst 57% do not. The non-users cultivate what is termed "retained seeds" which may either be obtained from their own harvest or purchased in the open market (but without any certification label attached). The data collection exercise was conducted and concluded in September 2015. The sample used for the purpose of this study should be treated with some caution. This study aims to give a "general impression" of how and why people behave in certain ways. It is possible that the average results do not paint a perfect picture of the region or sector and this should be taken into account when reading this report. This study is data-led and the results from surveys conducted were consolidated with qualitative interviews from key respondents such as religious leaders, village heads, farmer group heads and focus groups to arrive at reasonable conclusions.

3.4. Progress out of Poverty (PPI) Index

PRISMA's goals are tied to improving the incomes of poor rural households, and the programme uses the Progress Out of Poverty Index (PPI) that helps distinguish different poverty levels and vulnerability amongst different household groups. The PPI questionnaire is a set of 10 easy-to-answer questions answered by household members so the programme can make a quick determination of poverty levels. The resulting questionnaire produces a PPI score, which is converted to give a percentile or likelihood that a household falls below a set of poverty lines. For the purpose of this study, four quadrants were developed to compare PPI scores. This includes the poorest (<p25), poor (p25-p49), middle income (p50-p75) and better-off groups (>p75). Each quadrant contains roughly the same number of households in order to compare differences across PPI groups. Table 2 displays the likelihood of each quadrant falling below the 150% Indonesian national poverty line (USD 2) and the USD 2.50 2005 poverty line.

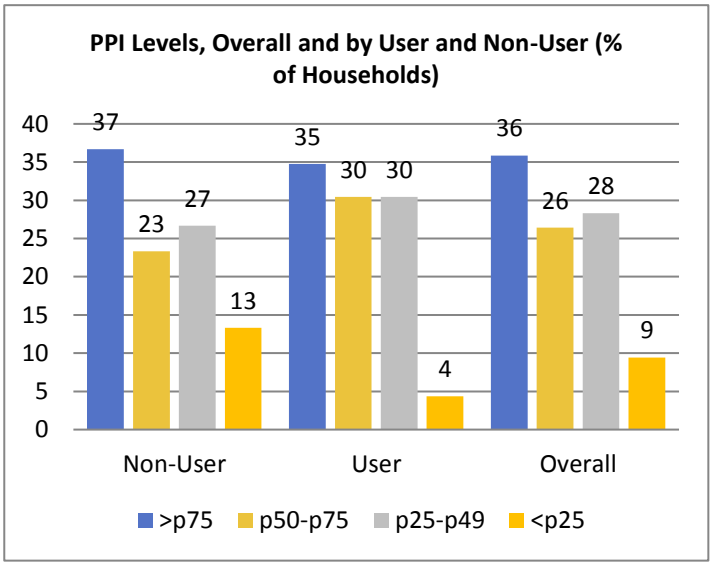
Table 2. PPI Scores and likelihood of households below the poverty line

Quadrant PPI Score	Likelihood below Indonesian 150% (USD 2) poverty line	Likelihood below USD 2.50 poverty line
Poorest <p25	76.2% and higher	95.2% and higher
Poor p25-p49	17.4% to 65.5%	54.7% to 91.5%
Middle p50-p75	0.9% to 9.9%	6.9% to 40.1%
Better Off >p75	0.4% and less	3.7% and less



At the village level, the average PPI score for the sample size overall falls within the poor range at p41, meaning the overall household, on average are 28% likely to fall under the USD 2 poverty line and 68% likely to fall under the USD 2.50 poverty line. Sambirejo, by the southern coast is likely to fall under the same poverty line as the average. Karangan has the highest PPI score at 45, which means this population is 17% likely to fall under the USD 2 poverty line 55% likely under the USD 2.50 line. Masaran has the lowest score at 38, or 41% likely to fall under the USD 2 poverty line and 80% likely to fall under the USD 2.50 line.

There is little difference in PPI level between users and non-users' of certified seeds. It appears that the PPI levels are highest amongst better-off farmers irrespective of whether seeds cultivated are certified or not. According to the PRISMA team, this result echoes that from the impact assessment carried out November 2015**. This means, even though Treggalek is a focus area for PRISMA, initial expectations suggesting the region was within a certain poverty bracket may be erroneous. Consequently, the impact study and this current livelihood study recommend improvements at targeting the poorest sub districts within this region, such as Massaran with a PPI of 38.**



4. Livelihood assets[2]

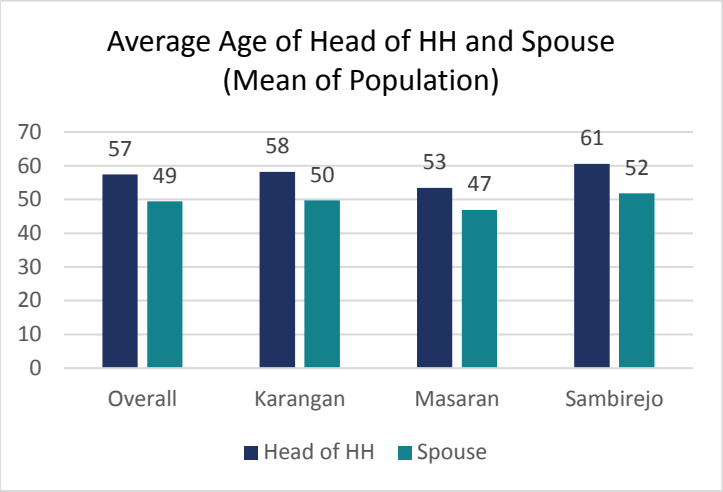
This chapter aims at giving a broad picture of the socio-economic position of the target households in Trenggalek, based on DFID's Sustainable Livelihood approach which incorporates 5 asset categories. Assessing these assets is the basis for understanding and evaluating constraints and opportunities that impact the livelihood strategies and subsequent decision making of the target households. The approach also helps conceptualize and understand ways households allocate and use resources to make a living given their specific socio-economic and natural environment. The 5 different asset types are analysed and explained below.

4.1. Human Assets

At the household level, human assets refer to the quantity and quality of labour available and this varies according to household size, education and skill levels, culture, leadership potential and health. It is therefore necessary, though not on its own sufficient, for the achievement of positive livelihood outcomes.

4.1.1. Household Size and Culture

[2] The Livelihood Approach is based on the belief that people require a range of assets to achieve positive livelihood outcomes. The assets which people need can be categorised into human, natural, physical, financial and social capital. (Livelihood Strategies; Tomson)



Overall, there is no difference in the size of households across all three villages. On average each household has four members and an average of one child. Qualitative data suggests households comprise of three generations with many grandparents still residing in the family home (34% of household heads live with their grandchildren). The average age of the household head is 57 years, ranging from 35 to 85 years whilst the average age of the spouse is 49 years. All heads of household are married. It is interesting that this region reports a rather low number of children within the household as well as an "aged community". Perhaps this might be further investigated to uncover what this means to cultivating Soybeans?

The percentage of female-headed households in Trenggalek is 4% with two female-headed household in the sample; both in Sambirejo. Emigration within the sample size is not significant. Seven households (less than 10 people) have emigrated. Of these, half was due to the quest for work and are mostly men but a few young people have also been known to go outside of their villages to attend College or University. Emigration is highest in Sambirejo at 23% when compared to the other villages.

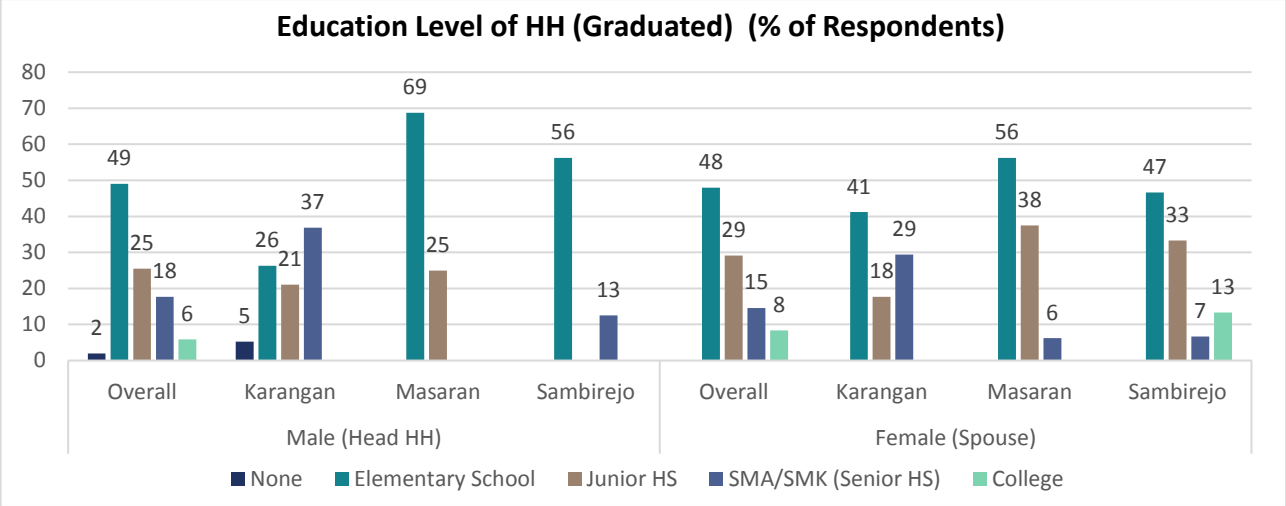
All respondents are Muslim with the majority (98%) identifying with the Javanese ethnic group.

4.1.2. Education

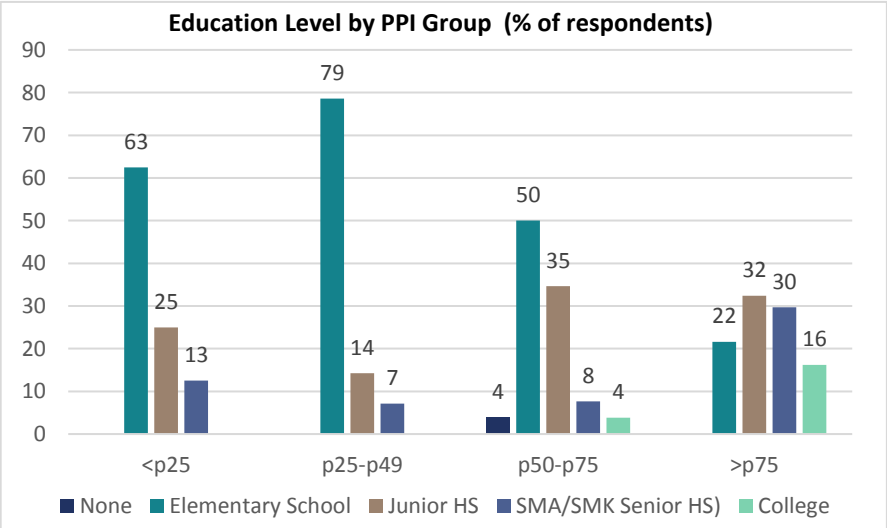
From the total sample size, 92% are literate in Bahasa. The remainder, not literate in Bahasa, are either less than 16 years old (specifically less than 5 years old) or over 50 years old. However, nearly all heads of household are literate in Bahasa. In contrast and according to qualitative data, the common language spoken in the region is Javanese and 13% of respondents cannot read and write in Bahasa. The Illiteracy of the household head in Bahasa is high in Masaran village (33%).

From the qualitative data, most respondents have either gone to school or attained some form of formal education; with just four people never having gone to school. Half of the household heads completed only elementary school and the level of education is strikingly similar between heads of households and their spouses.

According to qualitative data, almost all children are enrolled in school, except a few who are handicapped. The importance of education to farmers is particularly noticeable in Masaran, where children are reported to be excited about education and the community supports poor households pay schooling costs for children. Some young people study in Surabaya, Malang and Yogyakarta and in Karangan, only 20% finish Senior High School. According to the head of the village, some children drop out of school because "they are lazy or don't have enough money". In Sambirejo the education level is higher with 80% finishing Senior High School.



Examining education levels by PPI group, the poorest and poor groups are less educated (completing mostly Elementary and Junior High School) whilst the better-off group have an almost even split in the number of people that have attained all types of institutions. This might imply a correlation between education levels and extent of poverty. Further analysis on expenditure patterns and how (if at all) this might be distinguished between users and non-users of certified Soybean seeds is discussed in more detail in section 6.2



4.1.3. Health

Workdays lost due to health were an indicator used to determine how health may affect farmers' incomes in the study. Using this as a basis for analysis, it is difficult to ascertain because the quantitative data results show no connection between the number of days taken-off due to health and the different PPI groups. 11% report at least one member of the household being seriously sick and unable to work in the past 12 months.

What is however noticeable is the amount of expenditure reported on health across the sample data. In the last 12 months, 77% of respondents across all the PPI groups report having significant expenditure on health, suggesting this might be a grim issue in this region. However the PRISMA team considers this common in Indonesia, where the poor and vulnerable have limited access to good health facilities and consequently spend more in order to combat this phenomenon. Consequently, this revelation does not influence t**he teams'** current or future intervention strategy. Rather they believe this might be useful to a health-related programme wanting to make a difference in the lives of the poor.

4.2. Physical Assets

Physical assets comprise of basic infrastructure and goods required to meet basic needs and productivity, which includes assets such as affordable transport, adequate water supply, clean affordable energy, access to information and secure shelter and buildings.

4.2.1. Shelter and Housing

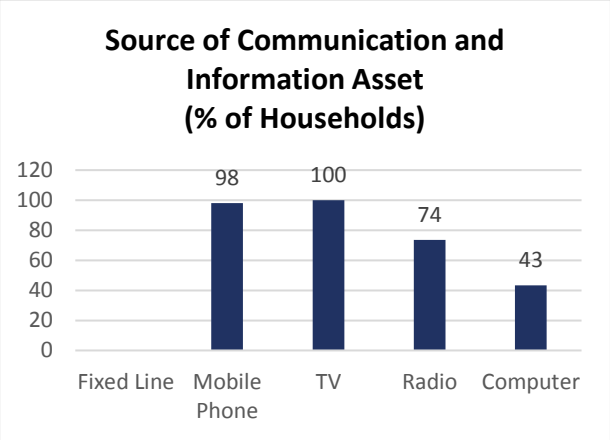
95% of the farmers in the study have their own houses. Of these, 85% are owned by men, 12% by women whilst 3% are jointly owned. 66% of homeowners have written ownership contracts. 3 households from Karangan and Sambirejo villages own a second house. The housing condition in the sample villages is reported as good and all having electricity. Over 80% of the houses in villages have tiled floors and 17% have smooth cement floors, mostly in Sambirejo.

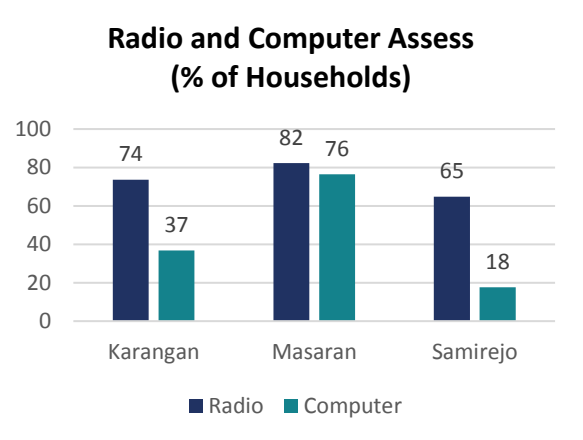
The main cooking fuel is firewood, which farmers collect themselves. 66% of farmers collect firewood whilst 8% purchase. However, 26% of farmers use gas for cooking. The main source of drinking water and water for household needs are private wells all year round. A few households use spring water and three households report having access to private or public tap water. Most households have a non-flush toilet with a septic tank.

Many of these results indicate this might not to be a very poor region and at first glimpse, the results from the quantitative data might suggest the level of poverty within the community may not low. However, **according to the PRISMA team, this is quite the contrary. Apparently, households'** sources of income for improving houses do not necessarily come from within the homes and cannot be considered an indication of livelihood. This is because many poor families are supplemented by children living abroad and use those remittances for home improvement. Further analysis on housing infrastructure and differences among villages and poverty levels are dealt with in section 5.1 to evaluate poverty.

4.2.2. Household Assets

Survey results suggest this region may be more sophisticated than most in terms of communication and computing assets. What may be interesting to investigate further is the age range of those using or with access to computers. Masaran leads all the other villages with regards access to radios' and computers. The PRISMA team could employ the highly available assets as a primary means of communication with their target beneficiaries in the region.



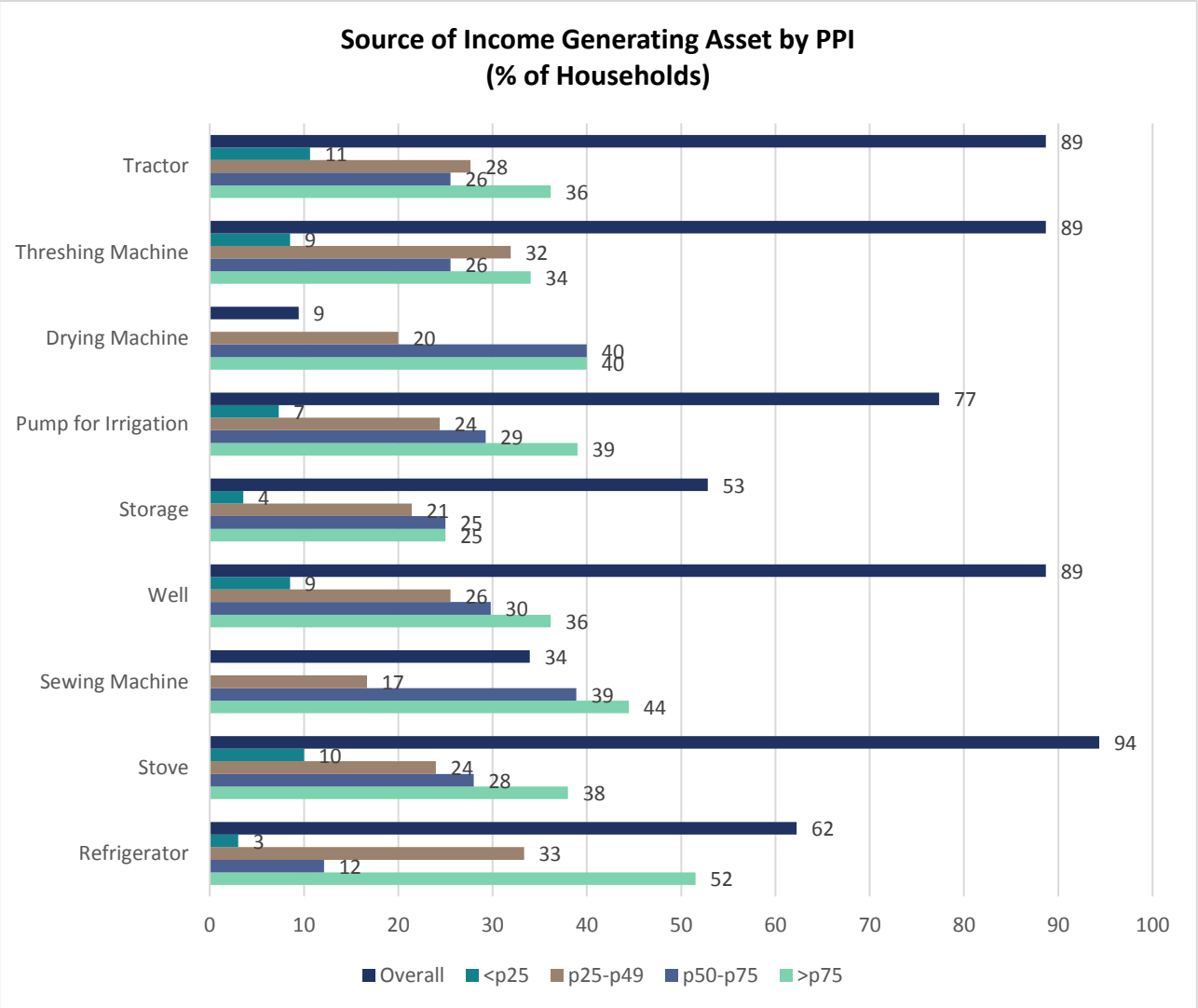


More than 90% of households have access to motorcycles and bicycles as a means of transportation and nearly 60% have access to a car. The PRISMA team feel this high percentage of those either having cars or with access might be misleading because from their own independent research, car ownership differs largely from having access. In addition, one is inclined to agree because the way this question was asked during the survey stage reflects some weakness in the survey design.

As for income generating assets, at a PPI level, the most lacking with the poorest groups are drying and sewing machines. Assets most available to the poorest groups are stoves, tractors, threshing machines and wells. Again, the PRISMA team challenged this result because it appears distorted. For

example, even though the better–off farmers have influenced the overall high result for tractor ownership, the survey question asked if respondents either purchased or had access to specific assets in order to determine level of poverty. This makes the result rather difficult to understand because many farmers in Indonesia with access to tractors received them from the government as part of a subsidy. Naturally they have access to one but that does not translate to being well off.

The PRISMA team may therefore wish consider designing interventions that capitalise on assets that are readily available or accessible to the poorest households rather than those that are not.



4.3. Natural Assets

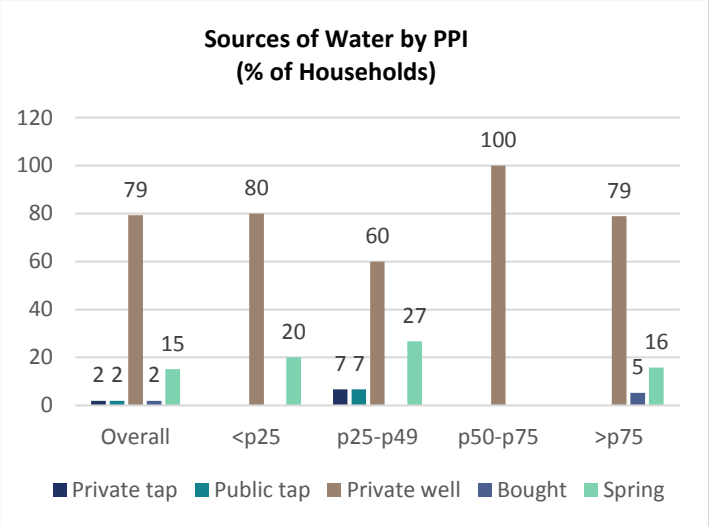
Natural assets are natural resource stocks including public goods (e.g. the sea) or divisible assets used directly for production (e.g. trees and land). Natural assets are very important to those who derive all or part of their livelihoods from resource-based activities such as farming, fishing, forests and mineral extraction. Natural assets also tend to greatly influence other assets important to livelihood. For example, farmers' production directly depends on the quality of soil, and when soil is polluted both farmers' health and crop quality suffer as a result.

4.3.1. Access to Land

Nearly 85% of farmers in the sample are landowners whilst 11% rent from others for agriculture cultivation. Across PPI groups, the highest average land use is amongst the middle-income and poorest groups. In Karangan and Masaran, farmers own on average 0,26ha of land whilst in Sambirejo the average land size is 0,32ha.

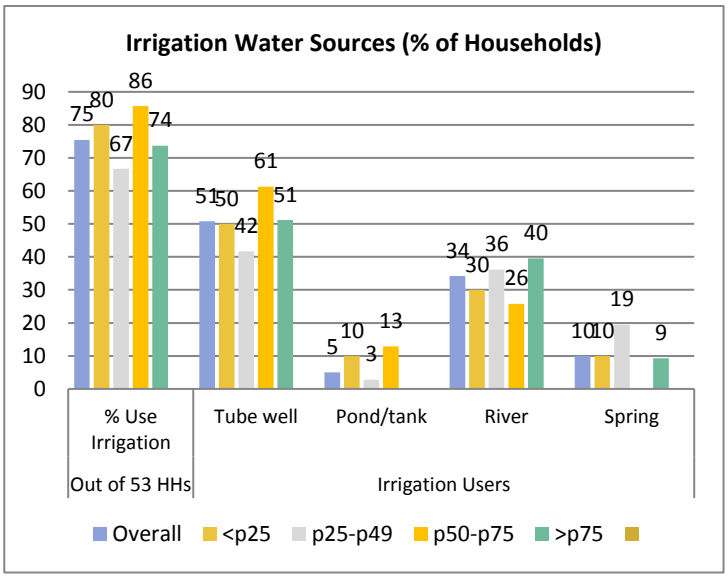
Although some of the land owned is inherited, 32% of farmers have purchased their land. Ownership certificates are important to this community as 59% of farmers have the government certificates whilst 25% have obtained traditional certificates. These certificate holders are mainly the male heads of household at 91%. These results may be useful to the SAFIRA team involved in financial services where land ownership and certificates form the basis of collateral when developing access to finance interventions to poor farmers.

4.3.2. Access to Water



Highly seasonal rain patterns remain a constraint to agriculture all over East Indonesia. In Trenggalek, the rainy season starts around November and lasts until May, with strong rains from December until February. Trenggalek ranks among the driest areas in East Java both in terms of amount of rainfall and groundwater storage.[3] According to qualitative data, farmers in the sample villages get water for household needs from wells. In Masaran, all households access a public well whilst in Karangan and Sambirejo, most households have a private well providing enough the whole year.

Private Wells is the dominant source of irrigation in the region and across all PPI groups. The next important source is Rivers. At the village level, Karangan and Sambirejo use wells as their main source of irrigation whilst in Masaran, rivers fulfil this purpose and 58% of households' do not use irrigation at all.



4.3.3. Other natural resources

According to quantitative data, 88% of the farmers in the region collect forest products for their own use whilst 13% sell these products for cash. For example, nearly all the farmers collect firewood and 30% collect timber wood for household consumption even though some of this is sold for additional income. 30% of farmers' also collect bamboo for their own use.

[3] Setyawan Purnama, Indonesian Journal of Geography: The potential of rainfall and its impact to groundwater storage in Java island, 2008

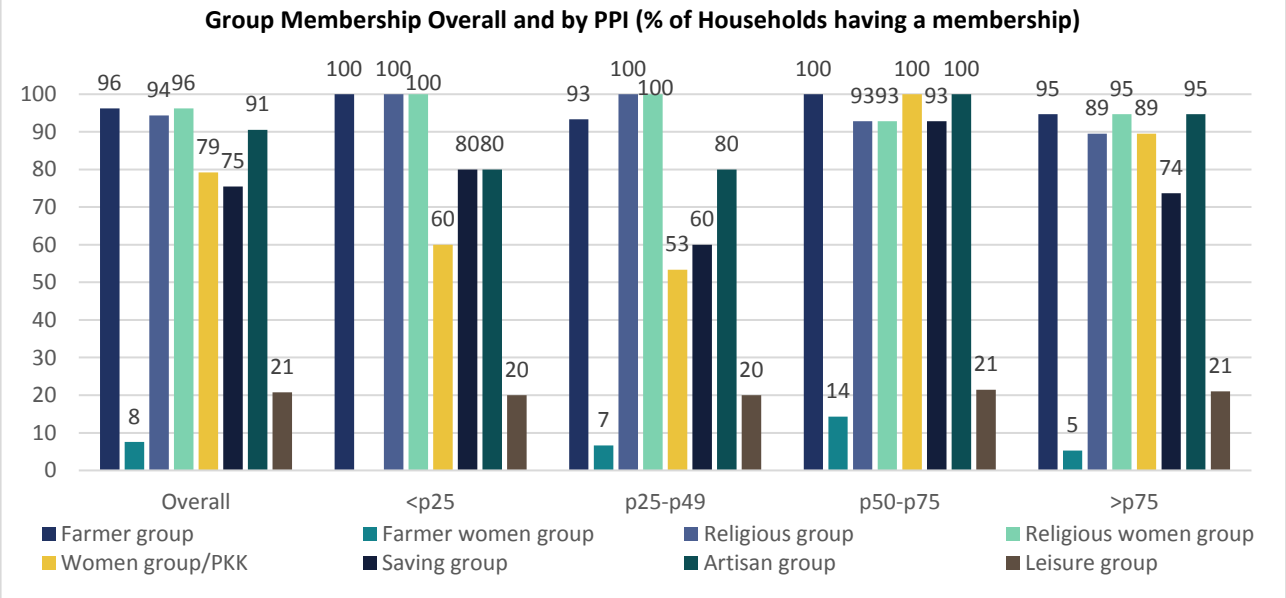
Although fishing (including lobster fishing) is common practise in Masaran, just three respondents' report using maritime resources. According to key informants in Karangan and Masaran, overexploitation of forests and deforestation remain a contentious issue in this region.

4.4. Social Assets

Social assets are resources upon which people draw in pursuit of their livelihood objectives. These are developed through networks, communities, shared interests, group memberships and relationships which facilitate innovation, development of knowledge and sharing of that knowledge. The number of group memberships is commonly used as an indicator for social assets in the Sustainable Livelihood Approach.

From the qualitative data, farmer groups are significant within the community with 96% of households being members to one. This is similarly true for female religious groups and religious groups in general. Irrespective of PPI groups, farmers across communities tend to join farmers groups first. The average annual fee for membership to a farmers group is 50,000 Rupiah and 80,000 Rupiah for the female religious group. This fee is considered expensive by half the respondents of this survey and apparently regarded as a deterrent from joining the farmers group. The other half stated a lack of time or need for joining the group.

The main benefit stated for joining the farmers group is agricultural input purchase and information on agriculture. This is validated by other benefits reported including information on GAP and cheap seeds. As for the women's group, religious groups and other leisure groups, meeting for social gatherings is the primary motivation for joining. This implies that farmers groups should be taken seriously by any stakeholder wishing to have an entry point into influencing **farmers' behaviours and activities in** the region. Interestingly, the head of the farmer group does not score particularly high at 2% in comparison to other people regarded as important in the village. The head of the village is dominant in this area with 60% while the religious leader scores 30%.



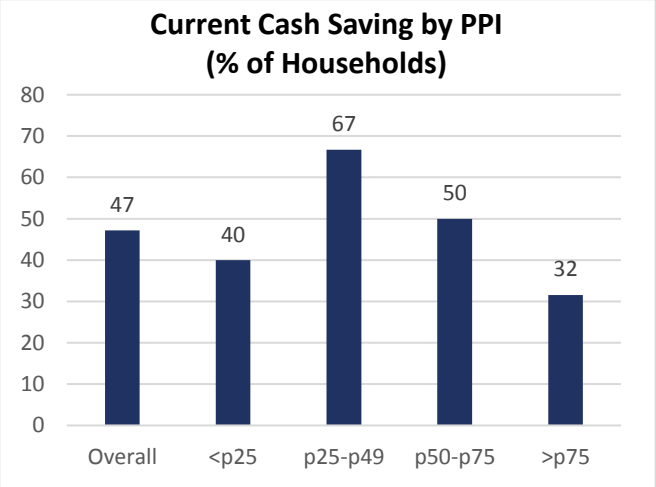
With regards support the community receives from government-sponsored programs, Raskin (rice subsidy) is the largest and this result is across all PPI groups. Out of 53 households', five receive Jamkemas (health fee waivers) and six get the BLT (conditional cash transfer). Five out of these six households' fall within the middle-income PPI group and are mainly in Sambirejo.

According to qualitative data, Gotong royong [4](community work) is practiced in all villages for infrastructure cleaning and repairing (roads and irrigation channels). In Sambirejo and Masaran the villagers come together to assist with renovating houses of neighbours or building a mosque. However, when it comes to agricultural activities, this practice is not extended. The qualitative findings suggest, that social networks are more important and more actively pursued in Masaran than in Karangan and Sambirejo where strong social cohesion is noticeable in everyday life but not bound to any one group. Villagers help each other in difficult situations. For example when people experience shortage of money or food. Sometimes, neighbours help by sharing part of their harvest or contribute towards schooling costs of poor families. The Muslim tradition of giving to the poor is visible in Masaran. Whenever there is some type of celebration, the less fortunate are invited and gifted food and/or money. This support system is self-organised by the community and has no formal structure.

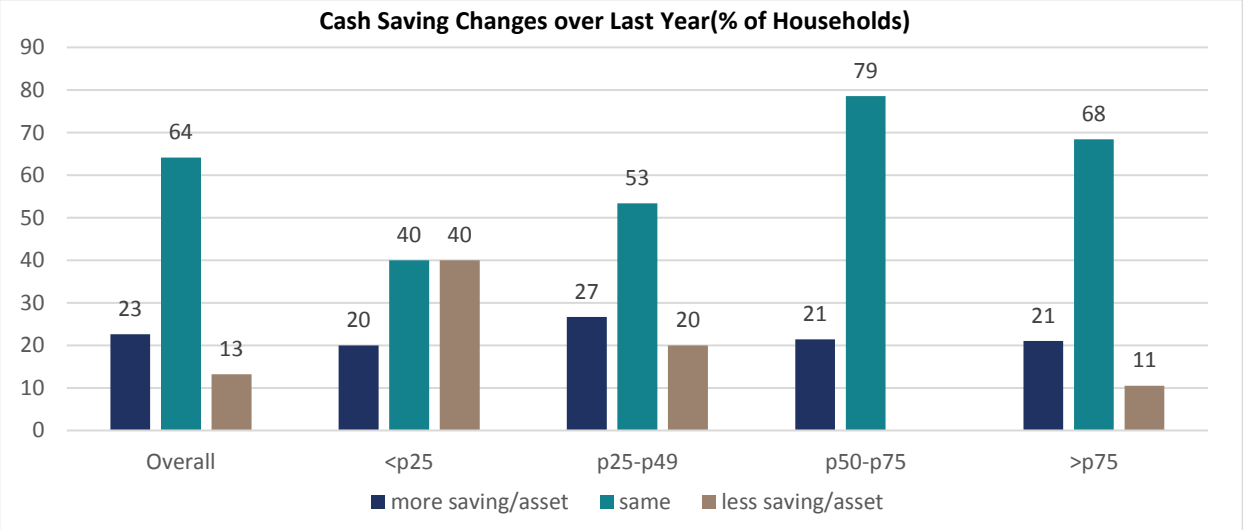
In Karangan there is a special form of Posyandu (Centre for pre- and postnatal health care) managed by the PKK-the village family welfare centre. It is serves as both a kindergarten and a training centre where mothers learn handicraft trades. In Sambirejo the youth group is said to be active.

4.5. Financial Assets

Financial assets refer to the availability of cash; near cash or its equivalent, which enables people adopt different livelihood strategies. There are two main sources of financial assets – first, available stocks; such as savings - which usually do not have liabilities attached to them or entail reliance on others, and second, regular inflow of money (i.e. excluding earned income) - usually pensions or transfers from the state and remittances with the key being regularity of the inflow.



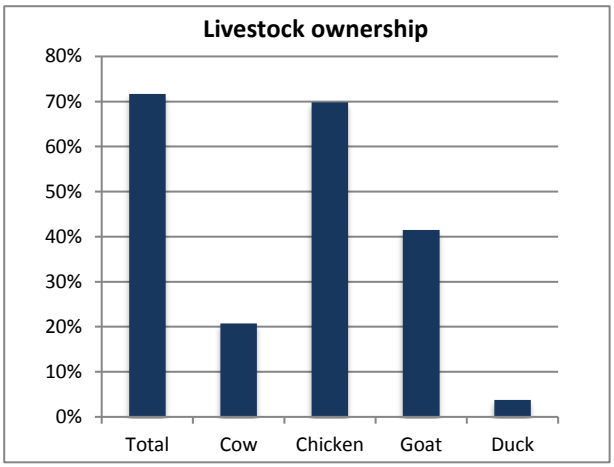
Overall and from the quantitative data, 47% of households have cash savings at home with the biggest savers being the middle-income PPI group. This **means they have enough financial resources' to purchase good quality** soybean seeds, if

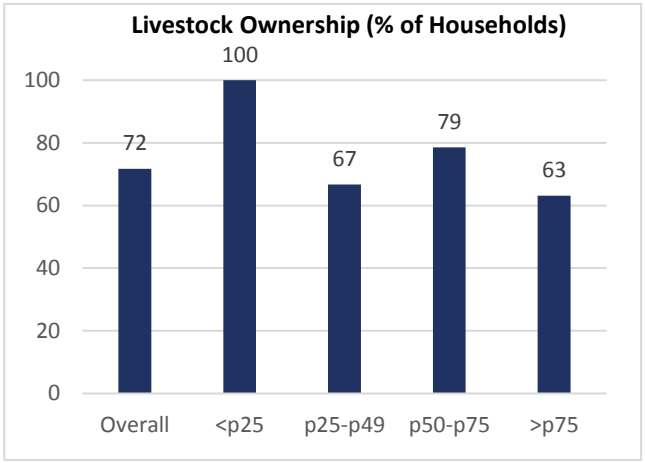


[4] Gotong royong is a special form of community work, which is very common all over Indonesia. It works informally and is only based on social control mechanisms. The primer purpose is to provide public services such as building village infrastructure (roads or irrigation channels) and keeping the village clean. In some villages, gotong royong is also practiced in agriculture e.g. for planting and harvesting.

available. Just under 10% of households have a bank account with these few being either in the poorest or better-off PPI group. This may suggest that financial literacy and awareness is still low and may be an opportunity for the SAFIRA team. At the village level, Masaran and Sambirejo record bigger cash savings than Karangan. Jewellery as a form of asset is prevalent across all PPI groups and 75% of the sample size own or have access to this form of asset.

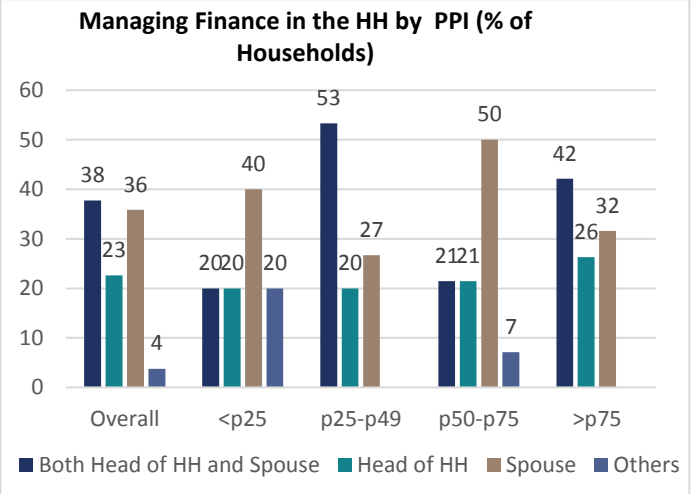
When asked to what extent cash savings have changed over the past 12 months, the results show that in general, farmers' position has remained mostly the same, especially with the middle-income and better off PPI groups. At a village level, both Karangan and Masaran have more households with the same living standard whilst in Sambirejo more households have experienced an increase in living standards in comparison to other villages.





Livestock is another form of savings within this community where proceeds from its sale are used to finance minor expenditures. More than 70% of households own livestock, mostly chicken and goats. 20% own cows and three households own ducks. Chicken and goat ownership is highest amongst the middle-income and better –off group whilst cow ownership is flat across all PPI groups. Cow and goat breeding tend to be undertaken by men whilst women manage chickens. Selling livestock is often the last choice for financing expenditures, when there is no cash and no stocked harvest available. Normally farmers immediately buy new livestock as soon as they can. But livestock ownership is highest amonsgt the poorest PPI group. **This result from livestock ownership should be of importance to the PRISMA team. They might consider educating farmers on the use of the waste products from Soybean cultivation (usally high in proten) to support their livestock investment. This might trigger more acceptance of improved seed variety especially if the nutritional claims can be validated.**

Overall, managing household finances is done by the head of the household and their spouses but within the poorest PPI group, this responsibility is undertaken by spouses (women); as is the same within the middle-income PPI group. At a village level, women are responsible for managing household finances in Sambirejo whilst the men take on this responsibility in Karangan. Recording finances is absent within this community and this may be an area for the PRISMA team to intervene or work with SAFIRA, if there is evidence this might lead to improved livelihood position of farmers or women.



From the quantitative data, just 5% of the sample has access to either loans or credit facilities and the source of this facility is split equally between the banks, family & friends and neighbourhood associations. According to qualitative data, all villages have access to loans via farmer groups or cooperatives. However farmers in this community are sceptical about borrowing cash because of the fear associated with an inability to pay back, when required.

5. Poverty and Vulnerability

The vulnerability context is that part of the livelihood framework outside people's control. In the short to medium term, not much can be done to alter it. In essence, people's livelihoods are affected by trends, shocks and seasonality, which could have significant effects on households, especially the poor. Shocks could be natural, economic, crop or human and seasonality may include changes in prices, production or even employment opportunities. Trends on the other hand are more predictable and not always negative. For example new technologies may be beneficial to poor people. Shocks can destroy assets and even force people to dispose of other assets as a coping strategy. This section will discuss the vulnerability context of the households in Trenggalek and their coping strategies, especially for the poorest households (p0-p49).

5.1. Poverty Assessment

In addition to assessing the likelihood of poverty per household, qualitative data on poverty perception was collected by asking village heads to describe their view of a poor, middle-income and better-off household per village and the assets associated with each socio-economic position. The comparison of perceptions is shown in Table 3 below. Each village reveals different perceptions of poor, middle-income and better off but common perception of poverty are having no land and working as farm labour.

Table 3: Perception of poverty by village heads:

Type	Karangan	Sambirejo	Masaran
Poor household:	• No land • Work as farm labour • Income only for food • No education • House from bamboo	• No land • Work as farm labour • Not enough income to meet daily needs • No motorcycle	• No land • Cannot meet daily needs • House from bamboo • House has dirt floor • No motorcycle
Middle income	• Own land • House is in good condition • Own motorcycle	• Own land (1/4-2 kulen) • Earn enough to meet daily needs	• Own land • Own motorcycle
Better-off:	• Good house • Regular Salary • Own car	• Own many assets • Do not need to borrow money	• Own car
Percentage:	According to the village head 15% of the households are poor, 65% middle class and 20% better off	According to a staff of the village office 60% of the households are poor, 30% are middle class and 10% better off.5	According to the village head only very few people are poor (0,5%), about 90% are in the middle segment and almost 10% are better off.

Qualitative data on living standards was also collected by asking key informants to describe changes within each village over the past 10 years with regards housing, income & employment, the environment and agriculture. The comparison of perceptions is shown in Table 4 below and it appears temporary migration is an adopted strategy to cope with poverty. Seeking jobs abroad might also indicate a lack of employment opportunities in the villages and region even though fishing and picking clove provide additional income to farmers during dry season, in Masaran.

Table 4: Perception of living standards by key informants:

[5] According to the interviewer, this statement might not be accurate.

Living Standards	Karangan	Sambirejo	Masaran
Environment	• Increasing water shortage because of deforestation		• Depleted forest resources, especially wood, because of overexploitation
Housing	• Housing situation improved because of a government home improvement program	• Improved toilet facilities because of a government program - PNPM.	• The situation has improved continuously
Income and Employment	• Income in the agriculture sector increased due to higher wages for farm labour (5 years ago wages were 30-35k/day, now 55-60k/day). • Migration • More people work abroad in Hong Kong, Taiwan and Malaysia (5%) and about 20% are working in different places in Indonesia (Kalimantan and Papua as farmers and Surabaya or Jakarta as entrepreneurs). On return to the village they build or renovate their houses or start their own business	• The unemployment rate decreased because many people working in other place as a labour etc. Aid program • The number of households in receipt of RASKIN decreased from 199 HH to 99 HH in the past 10 years	• Unemployment rate increased. The village is isolated and there are limited job opportunities (lack of industries). • More people work as fishermen today because it is more profitable than farming (up to 5 million rupiah/night) • Migration • Many people work abroad e.g. to Papua to be construction workers and there are some people working in Malaysia as farm labour.
Agriculture	• Better knowledge about GAP for planting soybean and paddy with the right spacing	• Better knowledge about GAP • Using tractor instead of cattle for land preparation	• Marginalisation of agriculture especially in dry season, because fishing and clove picking is more profitable • No support from extension workers so farmers do not know about GAP • Climate changed: planting more soybean instead of maize

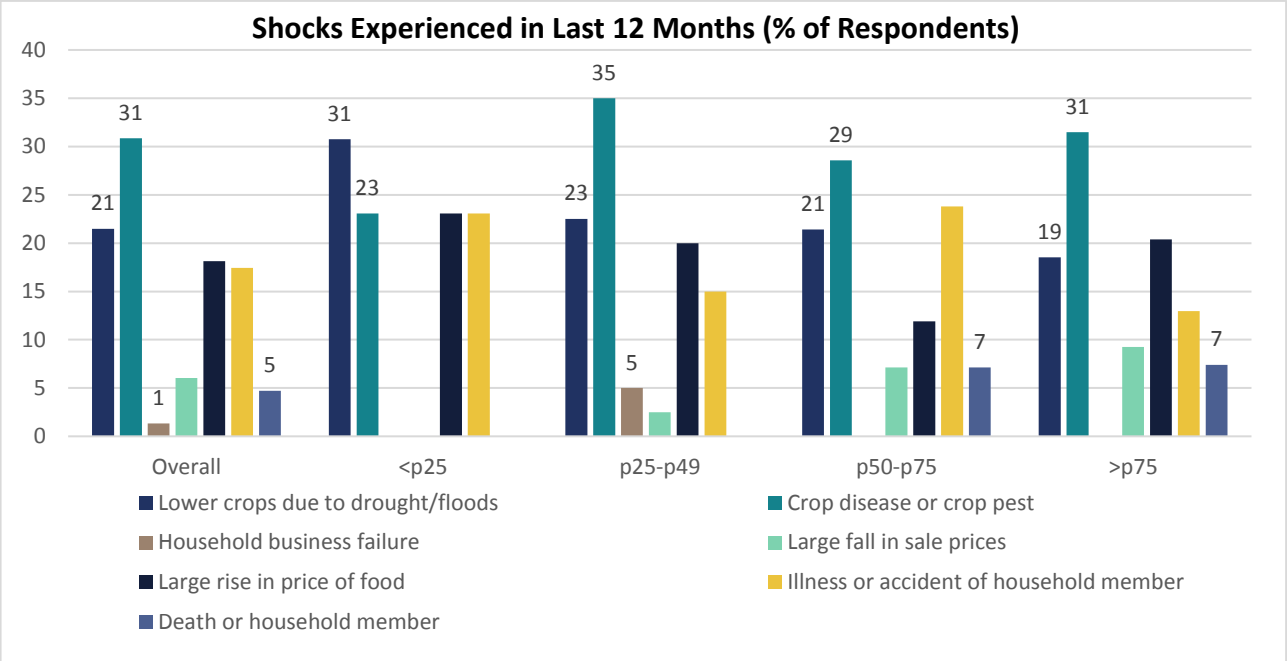
5.2. Vulnerability, Shocks and Food Security

In assessing the nutritional habits of households within the three villages, households typically eat around 3 types of high nutrition food per week. Household members within the higher PPI scale have better nutrition habits in comparison to those on the poorest scales. At the village level, Masaran is nutritionally the most vulnerable and Sambirejo is highest in nutrition source variety. In general there was no household across all three villages that reported consuming less than enough food and this was validated by key informants who stressed that during the past 10 years, farmers have had enough food to meet their household needs. Perhaps this is due to the staple and subsidies available in this community? If one considers the availability of staples consumed from own production over the year, nearly 100% of rice consumed is derived from own production. However, 66% of households in the sample also receive rice subsidises from the government. Maize on the other hand (another staple) is usually purchased as there is never enough produced from own harvest.

In general, the survey respondents report their most difficult months for livelihood shocks to be August, September and October. For the poorest PPI group, the most difficult month is October whilst other PPI groups report August. To cope with food difficulty, these households borrow from friends first, before ultimately reducing food intake.

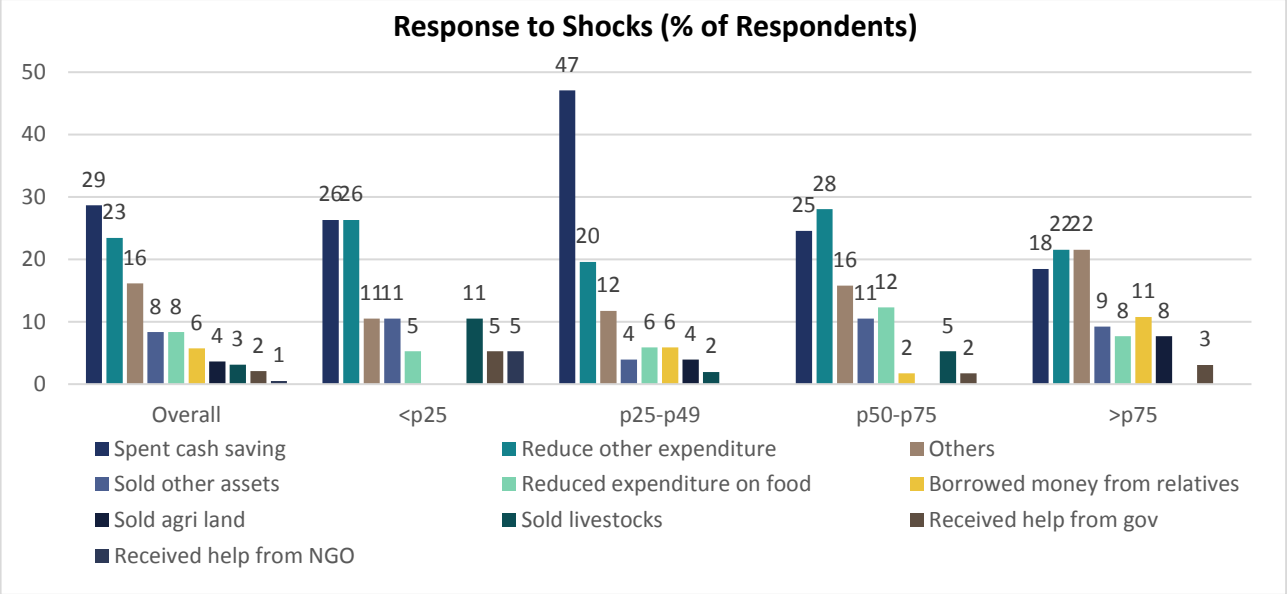
Even though the survey does not reveal in detail why certain months are more difficult than others (and this could be further investigated), it shows the most frequent reason(s) for difficult months. These include difficulty associated with accessing water (50%) followed by lack of money (22%) and pest attack (9%). This revelation does not surprise the PRISMA team because the soybean-planting month is July. Farmers therefore make financial investments at that point and because the harvest is not due for **a few months after, it's natural for these months to be difficul**t The implications for the PRISMA team wishing to design a new or revise an existing intervention could be **to develop activities that don't require**

any (or significant) financial outlays during these difficult months. The PRISMA team should also be aware of these months, intervene at the appropriate time of the calendar year, and plan so that people are prepared and receptive.



The graph above lists the number of shocks (and causes) experienced by households in the past 12 months. Each household was asked to rank the top three shock experienced, and the table counts the number of times a particular shock was mentioned. Overall, the results show that crop disease present the biggest challenge for Soybean farmers. This is followed by poor harvest due to droughts or floods and finally illness of a household member; all resulting in the loss of income that affects livelihood position. However, if we further analyse the results based on the poorest groups, the top three shocks mentioned are droughts & floods, crop disease or pest, large fall is sale prices and illness in the family. This is corroborated by qualitative data from key informants saying there were no major shocks reported or experienced within this community except small floods during rainy season. Droughts in the dry season, especially from September to November are perceived as part of normal seasonal challenges. But pests and disease are considered major risks to farmers especially in May and June.

The most common strategies adopted and reported by farmers to cope with or overcome these shocks are (in order of importance) spending cash savings, reducing other expenditure and other unspecified reasons. This result is consistent across PPI groups.



6. Choices and Livelihood Strategies[6]

Further to understanding the assets farmers have access to and the vulnerability context, this section aims to discuss how farmers use and combine their assets to make a living. The drivers behind farmer behaviour given the asset available to them may be to:

- meet basic needs
- protect assets i.e. minimize exposure to risk or increase coping capacity
- increase assets/income
- increase consumption.

These priorities can be discussed broadly under income sources and expenditures with an emphasis on evaluating the behaviours of Soybean farmers

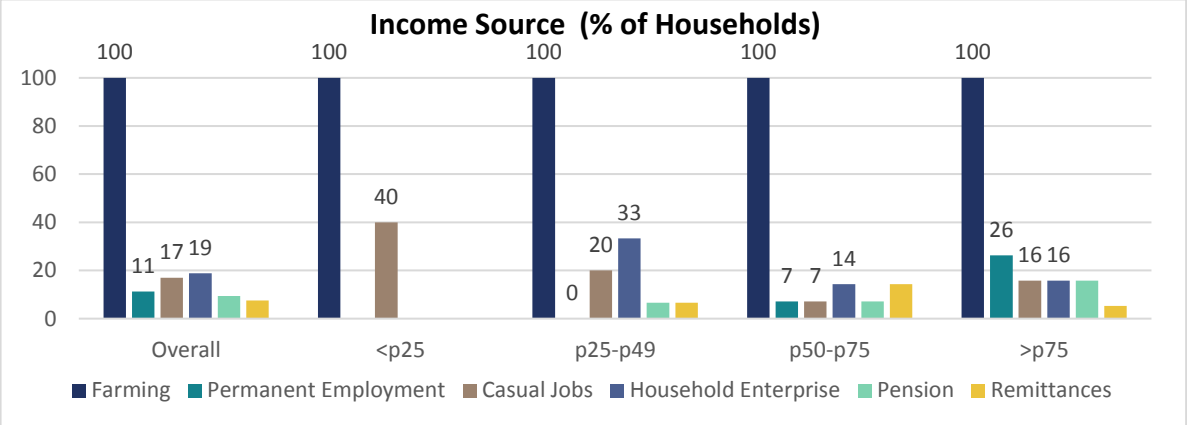
6.1. Income Sources

The main crops for income all three villages are paddy and maize as primary crops and soybean as a secondary crop, usually planted in the off-season. The result from the survey should be carefully considered as the sample reflects soybean farmers who own land (PRISMA target group). From the quantitative data also, farming remains the dominant source of income for respondents. Causal jobs and household enterprise also feature significantly. According to qualitative data, up to 80% of the population in the region get income from farming with most working as farm labour, because they don't have their own land. In Samirejo and Karangan entrepreneurship is another important income source. The Table below analyses the income sources across the three-sample villages according to qualitative data.

Karangan	Sambirejo	Masaran
• 60% farmers: 20% landowners and 40% farm labour	• 70% farmers: 30% landowners and 40% farm labour	• 80% farmers (no data on landowners and farm labour)
• 25% work outside of the village	• 20% traders and entrepreneurs	• 15% fishermen
• 8% have own enterprise	• 10% government employees	• 5% employees (government or enterprise)
• 7% government employees		

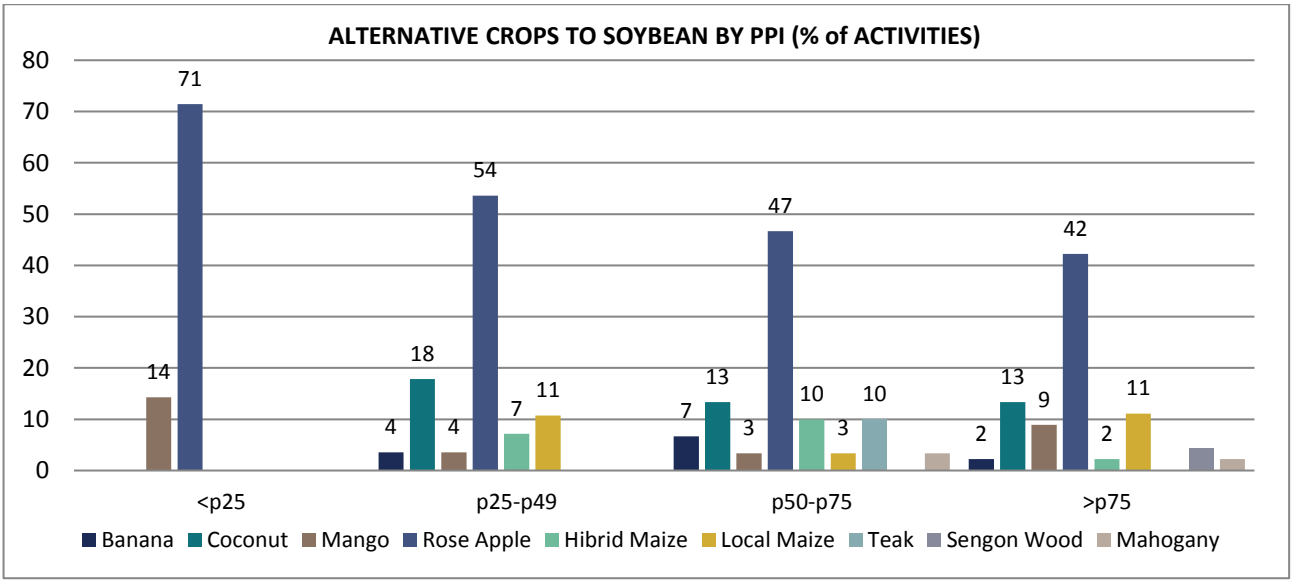
[6] The term livelihood strategy is used to describe the range and combination of activities and choices that people make in order to achieve their livelihood goals (Livelihood Strategies, Thomason Kalinda and Augustine Langyintuo, 2014)

Table 5: Income Sources from Qualitative Data



A big part of these farmers have additional non-agricultural income sources. Since diversification of income sources is one strategy adopted to cope with poverty, the number of income sources is an important measure of farmers' livelihood position. 49% of the respondents get income from farming only. 51% have at least one other income source besides farming. The working patterns are seasonal and many farmers leave their land idle during the dry season to engage in what they consider more profitable such as fishing and clove picking or working as labourers. The PRISMA team may want to consider targeting farmers with one source of income rather than two; as they may be more vulnerable. If this is true, they may be more willing to invest in better quality seeds capable of giving better yield and improving livelihood position.

The dominant alternative crops to Soybeans in this region are Rose apple, Coconut and Mango. Naturally, these provide additional income to farmers. Since extension workers are not active in Masaran, farmers do not have sufficient knowledge about alternative crops to plant during dry season. This is an opportunity to implement the second phase intervention on promoting GAP.



The findings from the qualitative data suggest that cropping patterns are influenced by rain patterns. The rainy season lasts from end of November until June with much rain between January and March and less rain from April to June. There are three planting seasons in Trenggalek with a break at the end of the dry season, when most of the land lies idle. Farmers usually invest in paddy and maize because these crops are perceived more profitable than soybeans. According to the key informants, paddy, maize and soybean are sold to collectors who pick up their products from the farmers' houses.

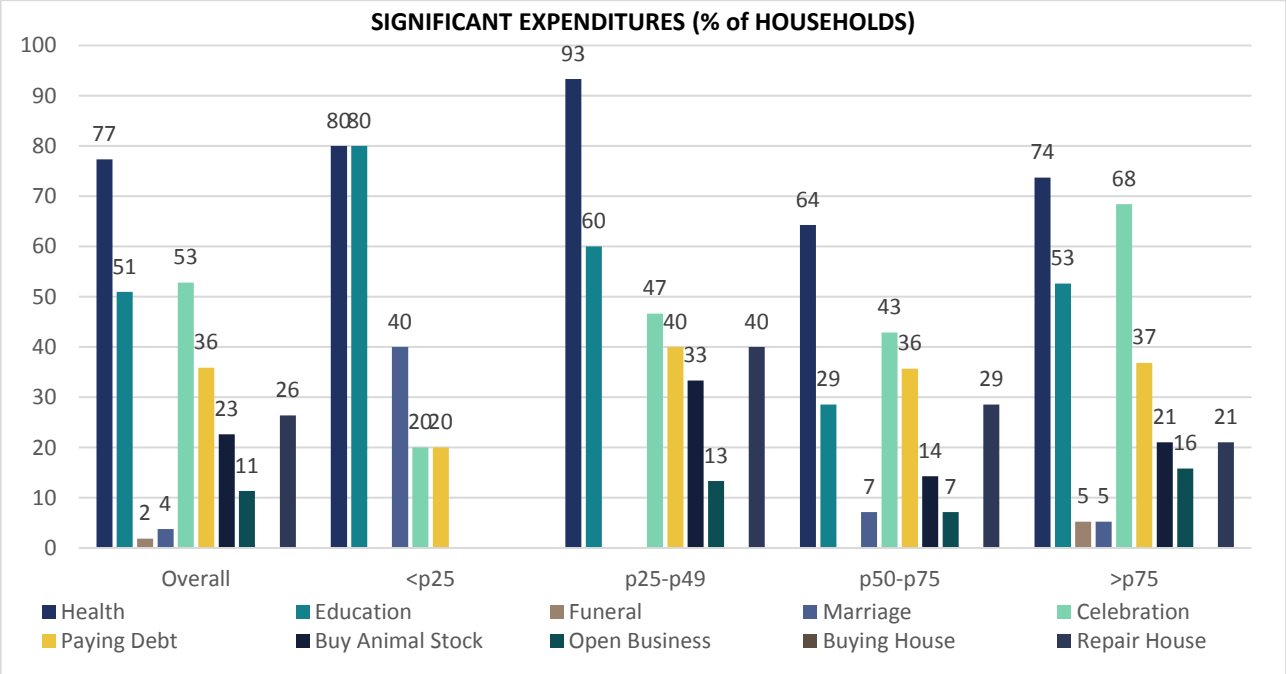
Table 6: Cropping Patterns

Village	Dec – March	April - June	July - August	Sept - November
Karangan	Paddy	Paddy (Maize)		Maize, Soybean, Tobacco
Sambirejo	Paddy	Paddy (irrigation)	Maize and Soybean (no intercropping)	
Masaran	Paddy	Paddy, Maize and Soybean	Some Soybean	

6.2. Expenditures

The most significant expenditure recorded in the survey and in order of importance are health, education and celebrations (with the latter coming from the better-off PPI quadrant/farmers). Poorer households also have more significant expenditure than those better off. According to quantitative data, the largest expenditure in the community are on education and agricultural inputs (seeds and fertilizer for paddy, and to a lesser extent, tobacco and maize). In terms of frequency of expenditures (other than agricultural expenditures) the three target villages disclose differences. Respondents were asked about significant expenditures within the past 12 months and the most frequent expenditure reported were in health (in Karangan and Masaran) and education. Celebrations are considered important expenditures as well, principally in Karangan village. In Masaran, nearly 50% of the respondents invest in housing renovation.

Cash from household savings finances almost 80% of these expenditures. 17% is paid from income derived from the sale of crops, stored at home. This behaviour is common when cash is required for smaller expenses. Only 2% of the households report selling livestock or borrowing money. One household reported reduced consumption as a means to financing expenditure.



7. Determinants and Mechanisms for Decision Making

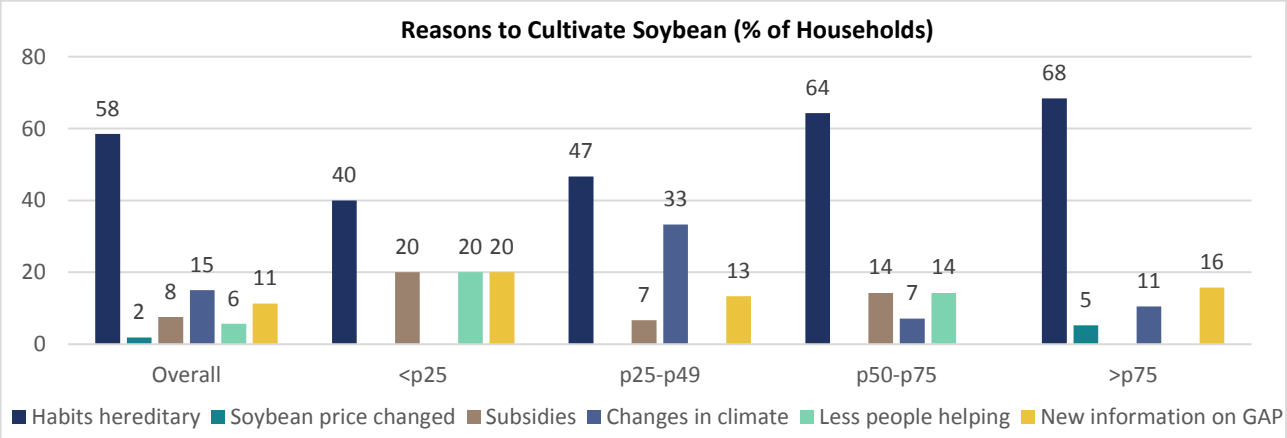
This section aims to understand the rationale and mechanisms for decision-making in relation to the livelihood assets, strategies and priorities already discussed – with a focus on Soybean-related decisions. If livelihood decisions made are based on assets available and the perceived costs and benefits required, this section proposes to identify assets required for harvesting soybean and discuss farmers' perception of cost, benefit and risk.

7.1. Focus on Soybean

Soybean has been cultivated in Trenggalek for a sometime and based on the quantitative study results, it has been ongoing for 20 years on average up to a maximum of 56 years. It is hardly surprising that the most dominant reason for cultivating Soybeans is therefore hereditary at nearly 60% across all PPI groups. Because the selling price of soybean is low in comparison to other crops, it is perceived by farmers as not-too-profitable. Despite this, no farmer in the sample considered discontinuing the cultivation of Soybeans. **This should be the PRISMA's** core target. Most farmers' plant soybean with minimal investment using retained seeds from the previous harvest, which require minimal maintenance i.e. watering and applying fertilizer. As a secondary crop with low risk, soybean is considered an important crop to poor farmers. Although qualitative data reports that soybean is only used for income and the quantitative data supports this claim with nearly 85% of farmers selling their produce for cash, 11% still utilise their harvest for domestic consumption.

Looking at changes related to soybean cultivation in the past 3 years, 30% of respondents (both users and non-users of certified seeds) report increases in yield attributable to new seed varieties and better information about GAP. This is further validated by the results of the study where the second most dominant reason for cultivating Soybeans is changes in climate and new information on GAP at 15% and 11% respectively.

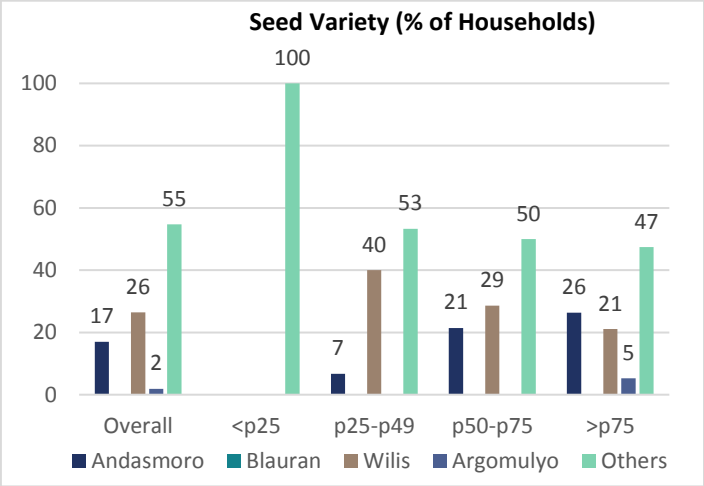
On the other hand, 13% of respondents experienced reduced yield because of pest attacks and poor climate conditions. Some challenges associated with soybean cultivation and reported are pests (caterpillar, wild pig, and monkey), access to inputs, and access to finance and market information. But these can be addressed under the second phase intervention on promoting GAP. Since farmers sell to collectors from their homes, they are believed to have weak bargaining powers because they also pay the collectors transportation costs thereby eroding their profit margins. For example, farmers in Masaran are reported to get 5'000IDR per kg instead of 6'000IDR.



7.2. Users of Certified Soybean Seeds

Soybean can be cultivated with minimal asset requirement. According to the qualitative data, not all land types are suitable for soybean cultivation. And in Trenggalek, cultivation is hardly influenced by climatic conditions, according to the PRIISMA team. Due to improvements with income of farmers, there has been a shift from maize to soybean cultivation, especially in Karangan in the past 5 years.

When survey respondents were asked the reason for planting soybeans, the first answer given was "*because it is easy*". The fact that soybeans has been cultivated for a long time is also an important determinant for the crop choice. There is a myth amongst some farmers that when the soil gets used to a certain type of crop, there is a high risk of failure, if farmers change to cultivating another crops.



Another reason farmer's plant soybean is because they are in receipt of subsidised certified seeds from the government. Since 2015, the government has been encouraging soybean production in Trenggalek by distributing subsidised seeds to farmer groups. But, according to the qualitative findings, the governments' distribution channels have several bottlenecks, which makes the process rather inefficient. For example delivery often results in delays and seeds sometimes arrive after the ideal planting period. There was also a report about the non-arrival of a truck carrying certified seeds for distribution to villages because the truck driver apparently sold them directly to tempeh and tofu factories.

Distribution via farmer groups is not without its share of problems, even though extension workers and the head of the farmer groups have an agreement to distribute seeds equitably to its members. Farmers are sceptical about the apparent benefit of certified seeds provided by the government because some were of bad quality. It appears that nearly all farmers in the sample using certified seeds got them freely from the government and they were almost certainly distributed through farmer groups. Of the 23 households in the sample that cultivate certified seeds (43%), only two actually bought theirs. On the other hand 90% of the non-users buy their seeds from the agro shop.

According to qualitative data, farmers have stated that even if they had better access to finance, they would still not invest in certified soybean seeds but rather other crops perceived as more profitable (such as paddy and maize). One of the respondents acknowledges that any possible investment in certified seeds depends on additional cost and on knowledge about GAP.

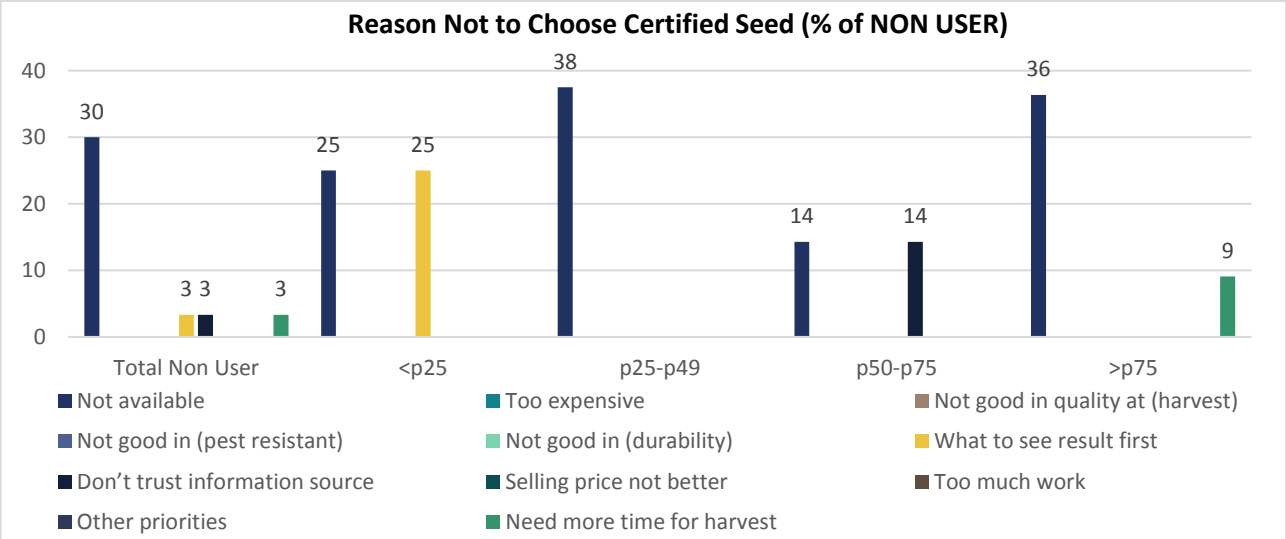
8. Decision-Making: Mechanisms

In order to understand how decisions about mango are made the study focuses on three questions:

- What sources do farmers rely on in order to get information required for making decisions?
- Who in the household is involved in decision-making?
- Who outside of the household is involved in or influences the decision?

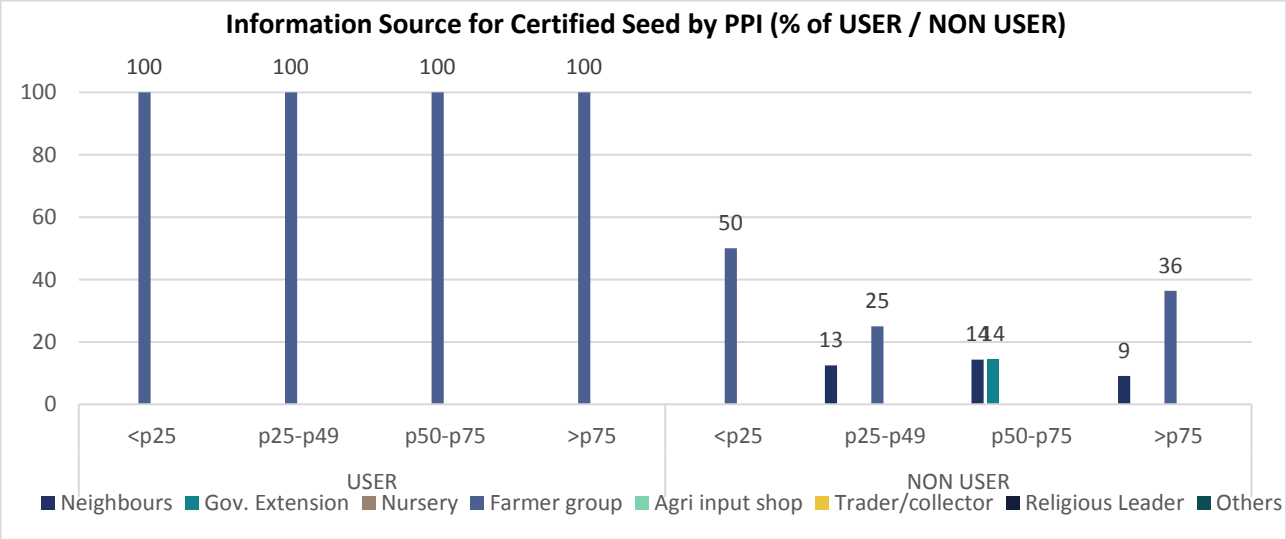
8.1. Sources of Information

According to the key qualitative data, the head of farmer groups obtains agriculture-related information from extension worker and passes it on to members. Non-members acquire similar information from their neighbours. Sometimes farmers get informed directly by the extension worker.

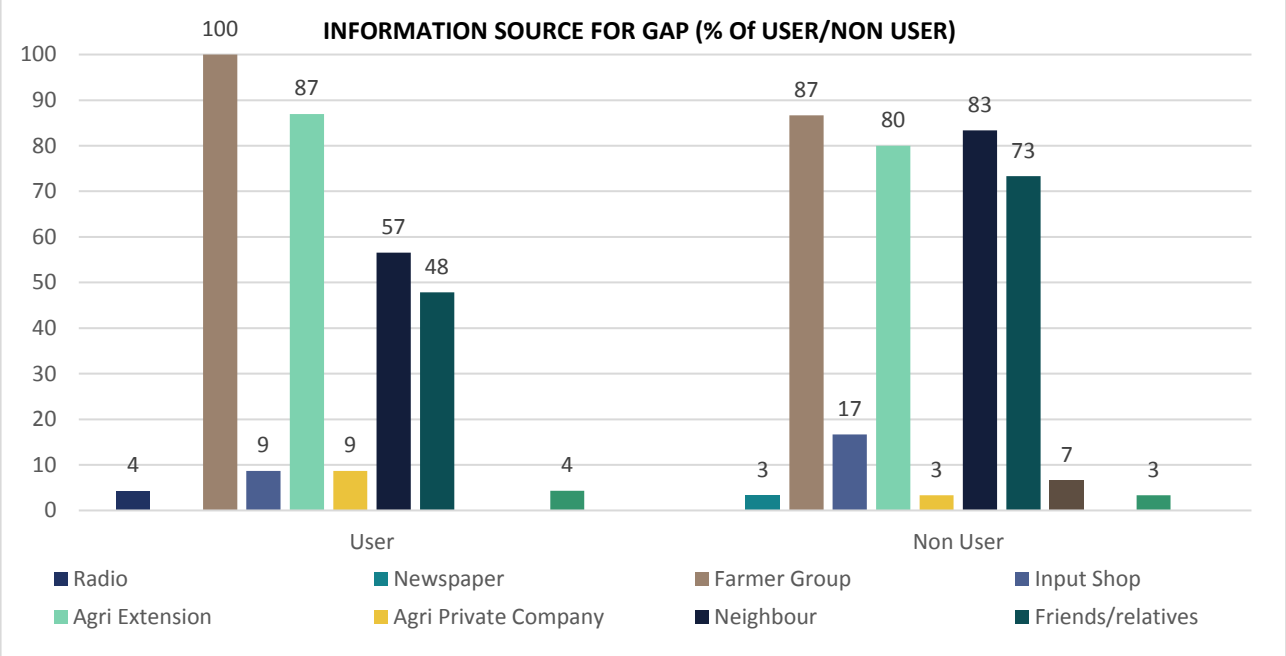


40% of the non-users have heard of certified soybean seeds, mostly from farmer groups (66%) or from neighbours (25%). Government extension workers informed a few respondents. The main reason non-users do not cultivate certified seeds (according to qualitative data) is the lack of availability, reported by 75% of the respondents. This is validated by the results from the quantitative study shown above. Presently, there is no commercial source for certified seeds. Other reasons mentioned are: they do not trust the source, they want to see the results first and it takes a long time until harvest. One option the PRISMA team may employ to get such doubtful farmers on-board might be the introduction demonstration plots.

All users in the sample learned about certified seeds through the farmer group. The main reasons for using certified seeds was because they got them for free (43%) and because it was recommended by the head of farmer group (35%). 13% of users started cultivating certified seeds because of the perception of higher yield and therefore quality. Some report following the advice of the extension workers who promised higher yield and easy handling.



On information sources for GAP, both users and non –users trust and rely on farmer groups the most and thereafter the extension workers.



8.2. Decision-making roles within the Household

In terms of crop choices, men are dominant in this community and usually decide on their own. In 25% of households sampled, women are involved in the decision about what crop to cultivate and 36% of men discuss with their wives.

Looking at decision-making related to soybean production, results from the three villages differ. In Karangan men make nearly all decisions only. Women only participate in harvest, post-harvest and marketing decisions within the household. In Sambirejo men make most decisions as well but female participation is higher than in Karangan. Females make some post-harvest and marketing decisions alone. Masaran shows a more equitable participation as men and women make most of the decisions together. Men dominance is somewhat higher with regards buying seeds and maintenance (fetching water and applying pesticides). Since women are the responsible for buying seeds, they automatically become crucial stakeholders in selling the benefits associated with cultivating certified soybean seeds. The table below provides detailed information about gender roles on decisions related to soybean.

Table 7: Gender specific activities related to Soybean

ACTIVITY	F	M	DESCRIPTION
Buying the seeds	X		Buying the seeds is a female task. They get information about prices and quality from neighbours.
Land Preparation	X	-	Since soybean is planted right after paddy (or another crop), there is not a big effort necessary for land preparation (no ploughing).
Planting	X	X	Both men and women are involved in planting. Usually men hoe to make the planting hole and women put the seeds.
• Make planting hole	X	X	If the land is big, they hire labour to help with planting. Example: 6 workers are needed for 1 kulen (180 m2) working from 7am -11am.
• Plant the seed	X	-	
Maintenance	X	X	Irrigation usually only once per months. Women help their husbands to install hoses or pipes and they bring food to the fields. Both men and women apply fertilizer. Men and women are both engaged in watering (spraying water). While women fetch the water, men do the spraying, because the sprayer is heavy.
• Irrigation	X	X	

• Apply fertilizer	X	X	Only some farmers do a second irrigation. Usually they have use a water pump and pay for petrol/diesel to run it. Therefore not all farmers do it.
• Watering			
• Second irrigation - optional			
Harvesting			Both men and women are engaged in harvesting.
Post-Harvest			Both men and women are engaged in harvesting.
• Drying	X	X	Both men and women are engaged in drying.
• Threshing	-	-	Threshing is usually not done by the farmers themselves, because they don't have a threshing machine. Farmers can hire a threshing service, which brings the threshing machine to the house and does the threshing.
Marketing			Marketing activities, negotiating the price and selling are typically female tasks. Buyers normally come to the farmer's house
• Negotiating price	X	-	
• Selling	X	-	
Financial Management	X	-	Females have a dominant role in managing the household financials, but discuss with their husbands.

8.3. Social dynamics of decision-making within the community

The survey findings suggest, that most decisions about agriculture are made in the household without any involvement of other people.

There are three major social authorities or institutions in Indonesia, which determine social processes: the governmental institutions, religious institutions and traditional structures. Most of the survey respondents (61%) reported, the head of village is perceived to be the most important person in the village by 61% of the sample households, the religious leader by 32%. The role of the traditional leader is minimal.

The government extension worker is the main source for agricultural information besides the head of farmer group. This suggests government influence might be significant if these extension workers are perhaps more efficient and effective. To demonstrate this potential power of the government, it is possible the shift from maize to soybean in Masaran within the past years were determined by government preferences rather than changes in climate.

9. Conclusions

In summary, the following conclusions can be drawn from this study:

Financial literacy and utilisation of financial products and services is minimal where just 5% of the sample have access to either loans or credit facilities. Trenggalek may be a suitable region for the SAFIRA team in many respects and this should be communicated to the relevant stakeholders. There could an opportunity to make a difference in the lives of poor farmers, given the development of a suitable financial-services related intervention

Membership to farmers groups is considered a priority for agricultural input purchases, GAP, cheap seeds and general information on agriculture, in this region. This implies that farmers groups should be taken seriously by any stakeholder wishing to have an entry point into influencing farmers' behaviours and activities in the region. Other important stakeholders' include heads of the villages and the religious leaders. Since women are the responsible for buying seeds, they automatically become crucial stakeholders in selling the benefits associated with cultivating certified soybean seeds.

Farmers will not opt out of soybeans cultivation despite challenges they face. This means the PRISMA team have a captive audience and everything should be done to ensure they remain so. Specifically, targeting farmers with one primary source of income (as they may be more vulnerable) might be one approach because they may be more willing to invest in better quality seeds capable of giving better yield and improving livelihood positions.

The top three livelihood shocks mentioned by the poorest farmers are droughts & floods, crop disease or pest and large falls in sale prices. Aside from the droughts & flood which are considered as seasonal challenges, addressing the other shocks could be the priority of the PRISMA team.

The availability of government subsidy influences farmers' choices about cultivating soybeans. This also affects PRISMA's ability to establish a sustainable, commercialised approach within this community. Careful consideration should be taken when deciding regions to work in as those with high subsidy dependency areas may struggle to get the desired result. According to the PRISMA team, in 2014, the government subsidy in Trenggalek was at 40%. By 2015 this had increased to 100%.

Finally, if the PRISMA team remains in this region, it's important to get on with the second phase of the intervention on promoting GAP as this is a recurring constraint from this study. 30% of respondents (both users and non-users of certified seeds) report increases in yield attributable to new seed varieties and better information about GAP. This should also help combat crop disease and pest attack, previously mentioned.